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TECHNICAL RESEARCH REPORT 1126

**New Classification Techniques--  
Status Report, 30 June 1962**

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( An Activity of the Chief of Research and Development )

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**New Classification Techniques**

**USAPRO Technical Research Report 1126  
NEW CLASSIFICATION TECHNIQUES--  
STATUS REPORT, 30 JUNE 1962**

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# BRIEF

## NEW CLASSIFICATION TECHNIQUES-- STATUS REPORT, 30 JUNE 1962

### Requirement:

DCSPER has a continuing requirement for maintaining and improving the effectiveness of the Army Classification Battery used in determining assignments of personnel within the enlisted MOS structure. Measures are needed of human factors not yet provided by the ACB, including measures of physical proficiency. Additional requirements are the development of techniques for identifying career-oriented personnel at entry into service and also, among men with moderately low general ability, those with special abilities the Army can use to advantage.

### Procedure:

NEW CLASSIFICATION TECHNIQUES research and research plans are currently being conducted in the following categories of activity:

- Improving differential classification through improvement of the Army Classification Battery.

- Identification and utilization of potential career enlisted men.

- Screening and assignment of lower mental category enlisted men.

- Physical proficiency measures as a means of classifying enlisted men for Military Occupational Specialties with given physical performance demands.

### Accomplishments to Date:

Updated new alternate forms of Automotive Information and Army Clerical Speed tests were developed, and, in a standardization run, found to be satisfactory replacement forms. A Tool Knowledge test and two Trade Knowledge tests, all designed to afford better differential prediction within the broad mechanical domain, have been constructed. Two information tests, Biochem Information and Chemical Information, were prepared as a means of differentiating prediction of performance in medical and chemical MOS from other MOS selected on the General Technical Aptitude Area. A series of personality and interest tests prepared by USAPRO scientists have also progressed to final validation stage.

In research to predict reenlistment, an instrument was developed and validated on intention to reenlist expressed at entry into service, correlating .52 with intention at entry and .22 with reenlistment intention after one year. Further analysis showed the measure to be a promising basis for a Career Inventory scale to predict final reenlistment action.

Two large samples of AFQT Category IV men are being analyzed to determine what screening and classification measures are effective in predicting Army job performance with men of this caliber.

### Utilization of Findings:

The new Automotive Information and Army Clerical Speed tests were made operational in January 1962. ACS-3 and 4, half the length of ACS-1 and 2 and administered in half the time, has eliminated a source of scoring error--the occasional failure to score the third page of the three-page answer sheet required in earlier forms.

As the extensive body of data collected for successive stages in the development of the various experimental tests is analyzed, results are applied as follows: New tests are introduced as operational instruments; findings are integrated with a view to generating new hypotheses regarding classification problems; and ultimately, aptitude area composites are reconstituted through the realignment of new and existing tests in relation to Army job families.

**NEW CLASSIFICATION TECHNIQUES--  
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## NEW CLASSIFICATION TECHNIQUES-- STATUS REPORT, 30 JUNE 1962

### TASK OBJECTIVES

Under the NEW CLASSIFICATION TECHNIQUES Task, research is conducted to increase the effectiveness of classification and assignment of enlisted men across the full range of the Enlisted Classification Structure. Initial classification and assignment to Military Occupational Specialties (MOS) training is based to a large extent on Army Classification Battery (ACB) scores, combined in aptitude area composites. A substantial research effort therefore must be devoted to improving the ACB with a view to achieving composites with greater differential validity for jobs in different occupational areas. Additional objectives of this Task are the development of techniques for special classification purposes, such as identifying potential career men for training in critical and long-term training jobs and identifying special skill potential in men of average or lower-than-average general ability.

The present report deals with current research and research plans and presents interim results in four related programs:

Improving differential classification through the Army Classification Battery

Identification and utilization of potential career enlisted men

Screening and assignment of lower mental category enlisted men

Physical proficiency measures as a means of classifying enlisted men for Military Occupational Specialties with given physical performance demands

### IMPROVING DIFFERENTIAL CLASSIFICATION THROUGH THE ARMY CLASSIFICATION BATTERY

The objective of initial classification is to make the set of assignments of enlisted men to MOS training, which, given the Army requirements and the pool of talent available at the time, will result in the most effective sum of job performances when training is completed. The ACB provides objective standardized measures by which the pool of talent is differentially classified. Research on the ACB is therefore designed to maximize the differential value of the tests for determining assignments to training. With this in mind, research efforts have been directed to constructing measures highly valid for one set of related MOS and relatively low in validity for other sets of MOS. A corollary activity is the maintenance of the usefulness of the ACB through introduction of new forms of the older ACB tests and of new tests measuring aptitudes not already represented in the ACB.



## Developments Prior to FY 1962

A continuing series of studies validating the ACB for a wide variety of MOS across all occupational areas has yielded extensive data on the value of the original ten test battery for differential classification. Integration of results on 73 MOS (Helme, 1960), while demonstrating adequate differential validity for all tests, nevertheless suggested that substantial improvements could be made in measures used as selectors for MOS in three occupational areas: Precision Maintenance, Military Crafts, and General Technical. Research was also undertaken on problems associated with expanded manpower requirements in the Electronics area. In 1958, a long-term research program on selection of combat men begun during the Korean War was brought to fruition by introduction of new measures and aptitude areas for the Combat Occupational Area. As a result of these different attacks on the enlisted classification problem, the status of the ACB by FY 1961 was as shown in Table 1. Three tests--Verbal (VE), Arithmetic Reasoning (AR), Electronics Information (ELI)--were introduced in 1957 as replacement forms for earlier ACB measures. Two noncognitive tests--The Classification Inventory (CI) and the General Information Test (GIT)--were introduced in 1958, substantially improving differential prediction for combat jobs. Six tests remained from the original 1947 battery.

Based in part on the prediction studies of 73 MOS referred to above, and in part on study of the enlisted MOS classification structure as set forth in AR 611-201, a complex of closely related test development projects was undertaken directed toward achieving the desired differentiation among job aptitudes.

### New Automotive Information and Clerical Speed Tests

Among the tests of the Army Classification Battery which remained unchanged since 1947, three--Automotive Information, Army Clerical Speed, and Army Radio Code Aptitude--had proved highly effective instruments for differential classification in the Motor Maintenance, Clerical, and Radio Code job areas, respectively. Up-to-date alternate forms of the Automotive Information Test and of the Army Clerical Speed Test, parallel in general content and item format to the 1947 forms, were constructed and standardized. The new forms--AI-3 and 4 and ACS-3 and 4--became a part of the operational Army Classification Battery in January 1962. Because of the small and changing nature of requirements for Radio Code personnel, replacement of the Army Radio Code test was deferred pending further study and developments.

The new Automotive Information Test demonstrated satisfactory reliability and correlation with the earlier operational forms, and a pattern of correlation with other ACB measures comparable to the pattern shown by the 1947 Automotive Information test. Its contribution to differential prediction can be expected to be equal to--or slightly better than--that of the somewhat obsolescent AI-1 and 2.

Table 1

## STATUS OF THE ARMY CLASSIFICATION BATTERY AT THE BEGINNING OF FY 1962

| Test                     | Form     | Date Introduced | Occupational Areas of Use                              |
|--------------------------|----------|-----------------|--------------------------------------------------------|
| Verbal                   | VE-1, 2  | July 1957       | Clerical, Graphics, General Technical, Radio Code      |
| Arithmetic Reasoning     | AR-3, 4  | July 1957       | Infantry, Graphics, General Technical                  |
| Pattern Analysis         | PA-1, 2  | 1947            | Precision Maintenance, Military Crafts                 |
| Mechanical Aptitude      | MA-5, 6  | 1947            | Electronics, Electrical Maintenance, Motor Maintenance |
| Classification Inventory | CI-1, 2  | Oct 1958        | Infantry                                               |
| Army Clerical Speed      | ACS-1, 2 | 1947            | Clerical                                               |
| Army Radio Code          | ARC-1    | 1947            | Radio Code                                             |
| General Information Test | GIT-1, 2 | Oct 1958        | Armor-Artillery-Engineer                               |
| Shop Mechanics           | SM-1, 2  | 1947            | Precision Maintenance, Military Crafts                 |
| Automotive Information   | AI-1, 2  | 1947            | Armor-Artillery-Engineer, Motor Maintenance            |
| Electronics Information  | ELI-1, 2 | July 1957       | Electronics, Electrical Maintenance                    |

The new Army Clerical Speed test was constructed to be one-half the length of the predecessor measure; its testing time reduced from ten minutes to five minutes. More important, the new two-page format has eliminated a source of scoring error which had been noted in the scoring of ACS-1 and 2, namely, occasional failure to score the third page of the three-page answer sheet. Feasibility of the change had been suggested by tryout of a 5-minute ACS form in the Army Qualification Battery (Bayroff, Seeley and Anderson, 1959), which had yielded a full range of scores despite the halved length. Similar results were obtained with the new ACB forms; furthermore, reliability (correlation with the 1947 ACS) and correlation pattern with other ACB tests demonstrated that the new forms could adequately replace the earlier ones. Results of analysis of the new AI forms 3 and 4, and the new ACS forms 3 and 4, are shown in Table 2.

Table 2

AUTOMOTIVE INFORMATION AND ARMY CLERICAL SPEED TESTS, FORMS 3 AND 4--  
RELIABILITY COEFFICIENTS AND CORRELATION WITH OPERATIONAL ACB TESTS

| Tests                              | AI-3 | AI-4 | AI-Op | ACS-3 | ACS-4 | ACS-Op |
|------------------------------------|------|------|-------|-------|-------|--------|
| <u>Automotive Information</u>      |      |      |       |       |       |        |
| AI-Form 3                          |      | 87   | 86    | 21    | 28    | 25     |
| AI-Form 4                          | 87   |      | 87    | 18    | 30    | 26     |
| AI-Operational Forms               | 86   | 87   |       | 18    | 26    | 23     |
| <u>Army Clerical Speed</u>         |      |      |       |       |       |        |
| ACS-Form 3                         | 21   | 18   | 18    |       | 75    | 74     |
| ACS-Form 4                         | 28   | 30   | 26    | 75    |       | 69     |
| ACS-Operational Forms              | 25   | 26   | 23    | 74    | 69    |        |
| <u>Other Operational ACB Tests</u> |      |      |       |       |       |        |
| Verbal                             | 39   | 39   | 38    | 47    | 46    | 46     |
| Arithmetic Reasoning               | 43   | 44   | 45    | 59    | 59    | 56     |
| Pattern Analysis                   | 45   | 43   | 45    | 46    | 43    | 45     |
| Classification Inventory           | 31   | 29   | 34    | 28    | 28    | 29     |
| Mechanical Aptitude                | 56   | 57   | 60    | 35    | 41    | 38     |
| General Information                | 62   | 65   | 64    | 37    | 33    | 38     |
| Shop Mechanics                     | 65   | 66   | 68    | 30    | 34    | 38     |
| Electronics Information            | 52   | 56   | 55    | 28    | 28    | 27     |

## Developing New Information Tests for Differential Prediction

The Pattern Analysis (PA), Mechanical Aptitude (MA), and Shop Mechanics (SM) tests of the Army Classification Battery--effective predictors of performance in broad general areas--were only moderately effective as differential predictors for more precisely delineated job families. Study of the Army's MOS system revealed need for better differentiation within the broad domain of mechanical jobs, embracing both the Electrical Maintenance job area (MOS first digit 3) for which the Electronics Aptitude Area measure ( $EL = \frac{MA + 2 ELI}{3}$ ) serves as selector and the Precision Maintenance and Military Crafts occupational areas, both currently selected on the General Maintenance Aptitude Area ( $GM = \frac{PA + 2 SM}{3}$ ). Further, in the MOS system, assignment to a heterogeneous group of MOS--medical, food service, military police, military intelligence, among others--is based on the General Technical Aptitude Area (GT). GT is a composite of two of the more general ACB measures, Verbal (VE) and Arithmetic Reasoning (AR). The differential value of these tests is not found in the General Technical Area, however, but only in other occupational groupings such as Infantry, Clerical, and Radio Code MOS.

New information-type tests in the form of large experimental item pools were prepared with the assistance of subject-matter experts. A Tool Knowledge Test, designed to replace the Mechanical Aptitude Test, emphasizes aptitude for working with mechanical tools and processes rather than comprehension of mechanical and physical principles. Content for two Trade Knowledge tests to replace Shop Mechanics was selected to differentiate as well as possible among Precision Maintenance occupational area jobs, and among various military crafts jobs, such as construction (MOS with first two digits 51), chemical (53), and fuel and industrial gas production (57). Two tests (Biochem Information and Chemical Information) were prepared to differentiate prediction of performance in medical and chemical MOS from prediction for other General Technical MOS.

Plans were made for construction at a later date of measures to differentiate Graphics MOS and Military Police MOS from the GT Aptitude Area.

The new test items were administered to large samples of general enlisted input and special MOS training input samples in the second quarter of FY 61. Data collected on the new information tests will be analyzed to obtain item difficulty indices and item intercorrelations on samples of general enlisted input, and item validity indices for MOS training course and job performance. These item indices are to be used to select the best items for differential classification at the reception processing point. Experimental forms of the tests, of operational (40-item) length, will be composed from the selected items and validated across a wide range of MOS, using both training and job performance criteria. From the validity data thus obtained, including correlations with current ACB tests, determination will be made of which tests to

introduce into the ACB, which ACB tests to replace, and what changes in the Aptitude Areas should be made. Table 3 presents a comprehensive picture of the MOS groupings to which the new information tests are to be applied.

#### The Army Differential Aptitude Series (ADAS)

In 1956, another large-scale research program was initiated and incorporated in the NEW CLASSIFICATION TECHNIQUES Task. This program was designed to extend the psychological factors measured in initial classification well beyond the scope of the original ACB. Based on factor analyses of aptitude tests found useful in other Armed services, in civilian schools and in industry, a set of 17 aptitude tests was assembled and administered to large samples of enlisted men in the sixth week of basic combat training. Samples were selected to represent benchmark occupations across all technical (noncombat) occupational areas. The aptitude tests were augmented by two long experimental noncognitive questionnaires made up of personality and interest items which had proved promising as predictors of performance in entry MOS in combat, mechanical, clerical, and other areas. End-of-training course grades and ratings of performance after six months on the job were obtained for men in the basic training sample. The two noncognitive questionnaires were administered to additional large samples to obtain data for item analysis and construction of new scales predictive of success in different occupational areas. By March 1959, data were collected in 21 MOS training course samples and in 14 MOS on-job samples. Data collection on the noncognitive questionnaires was completed in 21 training samples and 14 on-job samples by November 1959.

The statistical approach decided upon is the application of test selection methods to a matrix of intercorrelations among operational Army Classification Battery tests and the experimental tests as predictors and final course grades and job performance ratings as criteria. Findings will be utilized in deciding on additions to the ACB or on changing existing ACB tests and the aptitude area system. Among anticipated applications is the construction of a new Classification Inventory in which the present combat-valid content will be refined to a more concentrated set of items and the resulting measure then augmented by scales differentially valid for general military adjustment and for broad MOS groupings such as electronics, mechanical, and clerical. Cognitive measures which prove promising will be developed for validation and standardization with a view to inclusion in the Army Classification Battery.

Patterns of validity shown by the operational and the experimental tests will be considered for indication of needed changes in MOS groupings for aptitude area classification. Data on MOS groupings will be integrated with data from other current studies--particularly ongoing studies of the new information tests--for eventual use in a broad reconstitution of the aptitude area system.

Table 3  
DESIGN FOR APPLICATION OF NEW MEASURES TO OCCUPATIONAL AREAS

| Experimental Measures             | Electronics<br>(MOS 1st Digit)<br>2 | Electrical<br>Maintenance<br>3 | Occupational Areas            |                         |   | Motor<br>Maintenance<br>6 | Clerical<br>7  | General<br>Technical<br>9 |
|-----------------------------------|-------------------------------------|--------------------------------|-------------------------------|-------------------------|---|---------------------------|----------------|---------------------------|
|                                   |                                     |                                | Precision<br>Maintenance<br>4 | Military<br>Crafts<br>5 |   |                           |                |                           |
| <u>ADAS - Cognitive Domains</u>   |                                     |                                |                               |                         |   |                           |                |                           |
| Psychomotor (3 tests)             | X                                   | X                              | X                             |                         | X |                           |                |                           |
| Spatial (2 tests)                 |                                     |                                | X                             | X                       |   | X                         | X              | X                         |
| Reasoning (4 tests)               | X                                   | X                              |                               |                         | X |                           |                |                           |
| Perceptual Patterns (4 tests)     | X                                   |                                | X                             |                         |   | X                         | X              | X                         |
| Perceptual Speed (2 tests)        |                                     |                                |                               |                         |   |                           | X              |                           |
| Memory (1 test)                   | X                                   |                                |                               |                         |   |                           |                |                           |
| Number Facility (1 test)          | X                                   | X                              | X                             |                         |   | X                         |                |                           |
| Mechanical Experience (1 test)    |                                     |                                |                               |                         |   |                           |                |                           |
| <u>ADAS - Noncognitive Scales</u> |                                     |                                |                               |                         |   |                           |                |                           |
| Electronics                       | X <sup>a</sup>                      | X <sup>a</sup>                 | X <sup>a</sup>                | X <sup>a</sup>          |   | X <sup>a</sup>            | X <sup>a</sup> |                           |
| Mechanical                        |                                     |                                |                               |                         |   |                           |                |                           |
| Clerical                          |                                     |                                |                               |                         |   |                           |                |                           |
| General                           | X                                   | X                              | X                             |                         | X | X                         | X              |                           |
| <u>New Information Tests</u>      |                                     |                                |                               |                         |   |                           |                |                           |
| Tool Knowledge (1 form)           |                                     | X <sup>a</sup>                 | X <sup>a</sup>                | X <sup>a</sup>          |   | X <sup>a</sup>            |                |                           |
| Trade Knowledge (2 forms)         |                                     | X <sup>a</sup>                 | X <sup>a</sup>                | X <sup>a</sup>          |   | X <sup>a</sup>            |                |                           |
| Biochem Information (2 forms)     |                                     |                                |                               |                         |   |                           |                |                           |
| Chemical Information (1 form)     |                                     |                                |                               | X <sup>a</sup>          |   |                           |                | X <sup>a</sup>            |

<sup>a</sup>Spares tests to be developed from large item pool, designed to differentiate among and within these areas where possible.

<sup>a</sup>Sequence tests to be developed from large item pool, designed to differentiate among and within these areas where possible.

Table 3 shows the areas covered by tests of the Army Differential Aptitude Series as well as by the noncognitive scales and the newly constructed information tests in relation to the occupational areas to which the new measures are to be applied. Statistical analysis on the personality and interest measures is expected to be completed early in FY 1963. Present timetable calls for the validation and standardization of the new information tests following development of a new Classification Inventory and prior to the integration of findings to reconstitute the aptitude area system.

#### IDENTIFICATION AND UTILIZATION OF POTENTIAL CAREER ENLISTED MEN

An insufficient reenlistment rate among first-term enlisted men is of concern to the Army as well as the rest of the services, particularly the reenlistment rate for specialists in technical and craftsman areas in whom the Army invests considerable time and money in school and on-the-job training. The high turnover of personnel in these areas increases training expenditures and frequently reduces the quality of performance by making necessary the introduction of inexperienced replacements.

Such studies as that conducted by Dancer-Fitzgerald-Sample, Inc., (1957) have indicated that reasons for not reenlisting reflect not only the man's interests and needs, but to an important degree the attractions and frustrations of the Army as compared to those of civilian life. As a consequence, improvement in the reenlistment rate can theoretically be made by increasing the attractiveness of the Army and minimizing its difficulties. The Army has expended considerable effort in this direction. A second approach assumes that it will be possible to identify, during initial classification, the men who are more highly motivated toward the Army as a career. This information could then be used in assigning men to critical programs.

It is with this second approach that the USAFRO research effort is concerned. Specifically, the research plan has been designed to develop measures of career motivation for use in initial classification as a basis for assigning qualified career-motivated individuals to occupational areas in which training and retention problems are most critical. The effort is concentrated upon a long range developmental study of personality, attitudinal, and background measures as they relate to reenlistment intention and final reenlistment decision.

From item analysis of the 631 experimental test items, a 210-item key was developed based on reenlistment intention as expressed at entry into service. Item response frequencies obtained in the group intending to reenlist were compared with those for the group not intending to reenlist. The key was refined by deleting items which appeared to be criterion biased. Item data were retained for use in development of the final scale.

The initial "intention" key was then tried out on an independent sample. In addition to reenlistment intention expressed at entry into service, intention expressed after one year of service and job performance

data were obtained on men in the sample. The key correlated .53 with intention at entry, .22 with one-year intention, and .12 with performance ratings. Since the key was specifically developed for the prediction of immediate reenlistment intention, the drop against one-year intention was expected. Various judgment keys predicted one-year intention from .06 to .36 (Career Incentives Key). Initial career intention and one-year intention correlated .42. Neither was found to be related to job performance.

A third step in the study is the development of a Career Inventory scale to predict final reenlistment action and cross-validation of the key. Standardization of the scale will be accomplished on an independent sample of nonprior service enlistees. The scale is being constructed such that:

Items in Section I of the scale correlate positively with final reenlistment action and initial reenlistment intention.

Items in Section II correlate positively with job performance ratings.

Items in neither section correlate positively with undesirability (for conduct and/or personality reasons).

FY 1963 research plans include a study of changes in attitudes and reenlistment intention over the first enlistment term and identification of various factors affecting career motivation over the same time period. Major objectives of the study are to increase predictability of reenlistment decision and to study the effects of classification and assignment on career intention. An early step in this study is the preparation of a large pool of items including, in addition to the Career Inventory items, items covering hypotheses developed from research findings and items covering reactions to specific aspects of Army life--training, superiors, duties, etc. Some open-end response items will be provided. Items will be administered to experimental samples both at entry into service and upon completion of basic training. In a second round of data collection, the items will be administered to an independent sample at five, and in some cases at six, successive points in the individual's Army career:

At beginning of Advanced Individual (AIT) or other MOS training

At end of AIT or other MOS training

After approximately six months on the job (duty MOS)

After no less than one year on the job (duty MOS)

Near the end of the first service term

After any change of MOS or PCS



Reenlistment intention will be obtained at each testing. Performance data will be obtained for all save the initial testing. Data will be analyzed in terms of stability of attitudes over time and stability of item validity coefficients over the service term, with a view to developing content keys that relate to changes in reenlistment intention. In addition to building predictor keys, factors involved in changes in reenlistment intention will be studied.

#### SCREENING AND ASSIGNMENT OF LOWER MENTAL CATEGORY ENLISTED MEN

In response to a DCSPER requirement, a subtask was established in FY 1960 to determine effective combinations of screening and classification measures to evaluate the potential usefulness of enlisted men scoring in Category IV on the Armed Forces Qualification Test (AFQT). More recently, the question of qualitative distribution of manpower among the Armed Services has again emerged as a concern of the Department of Defense. Furthermore, planning for future mobilization needs has involved as one of many considerations the optimal use of men who, while scoring below average in general mental ability, yet possess special aptitudes that may prove useful in certain Army jobs.

To identify screening and classification measures and procedures useful with individuals of relatively low general ability, steps were taken to obtain follow-up information on a large sample of Category IV men who were enlisted in the period August to December 1958. A special provision permitted enlistment of Category IV men provided they attained a standard score of 90 or better on at least two aptitude areas of the ACB. Such a score indicates special ability at a level roughly equivalent to Category III level or higher on AFQT as a general ability measure. After these men had been in service from 12 to 18 months, follow-up visits were made to their organizations to administer personality-type measures and to obtain supervisor and peer ratings of on-job performance. To assure unbiased evaluations, all men in the same jobs and squads were included in the study, the purpose of the study and identity of the Category IV men being carefully concealed from all personnel except the project officers at the highest echelons concerned. In this way data were obtained on large samples of experimental group Category IV men and on samples three to four times as large of higher mental category men in the same MOS to serve as a control group. A sample of about 150 Category IV men who had received early discharges for unfitness or misconduct was also identified.

A second line of inquiry utilized data already on hand on large samples of men admitted to the Army in the earlier 1950's, on whom background data, ACB scores, training course grades, and on-job ratings had been obtained in other research projects. Many of these men had scored in Category IV on AFQT, including some who were in the lower half of the category and who lacked the two aptitude area scores of 90 or above later required for acceptance. These samples provide a wider range of ability than did the 1958 samples. As in the 1958 samples, plans for analysis were drawn up to compare these Category IV men with their classmates and co-workers studied in the same projects.

Approximate numbers of cases in the two samples--the 1958 enlistees and the earlier samples--are shown in Table 4. Analysis is under way to identify the optimal combinations of background variables, ACB and AFQT scores, and personality item scales for screening Category IV men. In addition, the study is expected to indicate what MOS are most suitable for men of this level, and to suggest modifications in classification procedures useful for this special group. Finally, the techniques and instruments will be validated on other samples of Category IV men held out from the analysis and on lower Category III men to determine whether they should be applied to all men below average on AFQT.

#### PREDICTION OF PHYSICAL PROFICIENCY FACTORS FOR ARMY JOBS

Midway in FY 1962, a research effort was initiated to extend the prediction of job performance to factors of physical proficiency, above and beyond the medical screening requirements represented by the PULHES system. Although some research in psychomotor abilities had been conducted earlier, only a small part of the area of physical abilities useful in Army jobs had been included. Plans have now been made to conduct research into factors of strength, flexibility, speed, balance, coordination, and endurance, and their importance in job performance in particular MOS. Physical performance measures are to be developed which, administered prior to classification and assignment to MOS training, will be predictive of the level of proficiency attainable at the end of Basic Combat Training, at the end of Advanced Individual Training, and in job performance.

Consultations have been held with research experts in the area of physical proficiency from the U. S. Military Academy and from the American Association for Health, Physical Education and Recreation (AAHPER) of the National Educational Association. Further consultative visits of this kind are planned, as well as visits to Army training centers. During FY 1963, some prototype measures of physical performance will be constructed, and supporting research problems will be delineated for possible contracting to universities or other professional organizations.

#### FY 1963 RESEARCH PLANS

With the development of new noncognitive scales measuring personality characteristics and interests related differentially to performance in different occupational groups, and with the further development of new information-type tests of ability, research on instruments for differential classification is entering a new phase. Emphasis is placed more and more on prediction of job performance through those personal characteristics which lead to enduring motivation on the job: interests, attitudes, work habits, and type of personal goals which make the job a career in which the man invests to the full his skills and efforts. This study is being undertaken in FY 1963 under subtask e, Development of Measures of Occupational Motivation. Three major areas of investigation have been mapped out:

Table 4

SAMPLES FOR ANALYSIS IN EVALUATION OF AFQT CATEGORY IV ENLISTED MEN<sup>a</sup>

| Occupational Group             | 1958 Samples       |         |       |         |                     |         |       |         |
|--------------------------------|--------------------|---------|-------|---------|---------------------|---------|-------|---------|
|                                | Complete Follow-Up |         |       |         | Mail Follow-Up Only |         |       |         |
|                                | RA-IV              | RA-III+ | US-IV | US-III+ | RA-IV               | RA-III+ | US-IV | US-III+ |
| Infantry                       | 200                | 200     | 60    | 90      | 55                  | 65      | 35    | 35      |
| Armor                          | 50                 | 40      | 20    | 20      | 10                  | 15      | 5     | 5       |
| Field Artillery                | 70                 | 70      | 30    | 20      | 20                  | 5       | 10    | 10      |
| Other Combat                   | 70                 | 50      | 20    | 40      | 15                  | 20      | 5     | 10      |
| TOTAL COMBAT                   | 390                | 360     | 130   | 170     | 100                 | 105     | 55    | 60      |
| Field Communications           | 35                 | 20      | 10    | 20      | 10                  | 5       | 5     | 5       |
| Military Crafts                | 35                 | 30      | 15    | 10      | 25                  | 20      | 15    | 10      |
| Automotive Maintenance         | 25                 | 35      | 5     | 15      | 10                  | 10      | 0     | 0       |
| Motor Transport                | 30                 | 20      | 10    | 20      | 25                  | 20      | 10    | 5       |
| Clerical                       | 20                 | 20      | 5     | 10      | 10                  | 10      | 0     | 5       |
| Medical                        | 20                 | 25      | 10    | 10      | 15                  | 10      | 0     | 5       |
| Military Police                | 0                  | 0       | 0     | 0       | 15                  | 20      | 5     | 10      |
| Other Non-Combat               | 20                 | 10      | 5     | 10      | 20                  | 15      | 5     | 15      |
| TOTAL NON-COMBAT               | 185                | 160     | 60    | 95      | 130                 | 110     | 40    | 55      |
| GRAND TOTAL                    | 575                | 520     | 190   | 265     | 230                 | 215     | 95    | 115     |
| Early Dischargees <sup>b</sup> | 0                  | 0       | 0     | 0       | 150                 | 0       | 0     | 0       |

| MOS Title                           | Earlier Samples |       |
|-------------------------------------|-----------------|-------|
|                                     | Current MOS No. | Cases |
| Infantry Communications Specialist  | 311.1           | 750   |
| Infantry Communications NCO         | 311.7           | 450   |
| Armor Communications Specialist     | 312.1           | 550   |
| Artillery Communications Specialist | 313.1           | 500   |
| Artillery Communication NCO         | 313.7           | 500   |
| Cable Splicer                       | 322             | 225   |
| Manual Central Office Repairman     | 327             | 350   |
| Teletypewriter Repairman            | 341             | 900   |
| Electrician                         | 355             | 600   |

Table 4 Continued)

| <u>MOS Title</u>                           | <u>Earlier Samples</u> | <u>Current MOS No.</u> | <u>Cases</u> |
|--------------------------------------------|------------------------|------------------------|--------------|
| Ammunition Storage Specialist              |                        | 411                    | 1400         |
| Turret Artillery Repairman                 |                        | 424                    | 300          |
| Metal Body Repairman                       |                        | 441                    | 350          |
| Welder                                     |                        | 442                    | 400          |
| Dental Laboratory Specialist               |                        | 452                    | 125          |
| Laundry, Bath, and Impregnation Specialist |                        | 546                    | 550          |
| Engineer Equipment Assistant               |                        | 620                    | 750          |
| Track Vehicle Mechanic (Artillery)         |                        | 632.1                  | 550          |
| Track Vehicle Mechanic (Armor)             |                        | 632.2                  | 500          |
| Fuel and Electrical Systems Repairman      |                        | 634                    | 1000         |
| Automotive Repairman (Track Vehicle)       |                        | 635                    | 1300         |
| Automotive Repairman (Chassis Rebuild)     |                        | 635                    | 200          |
| Automotive Repairman (Wheel Vehicle)       |                        | 635                    | 550          |
| Stenographer                               |                        | 712                    | 1050         |
| Postal Clerk                               |                        | 714                    | 550          |
| Personnel Specialist (Administration)      |                        | 716.1                  | 525          |
| Personnel Specialist (Management)          |                        | 716.2                  | 525          |
| Administrative Specialist                  |                        | 717                    | 750          |
| Movements Specialist                       |                        | 719                    | 450          |
| Finance Clerk                              |                        | 730                    | 600          |
| Machine Accounting Specialist              |                        | 743                    | 700          |
| Supply Clerk                               |                        | 760                    | 750          |
| General Supply Specialist                  |                        | 768                    | 350          |
| Medical Specialist                         |                        | 911.1                  | 450          |
| Medical Aidman                             |                        | 911.2                  | 500          |
| Neuropsychiatric Specialist                |                        | 914                    | 125          |
| Dental Specialist                          |                        | 917                    | 550          |
| Medical Laboratory Specialist              |                        | 931                    | 300          |
| Preventive Medicine Specialist             |                        | 933                    | 200          |
| X-Ray Specialist                           |                        | 935                    | 200          |
| Cryptanalytic Specialist                   |                        | 981                    | 450          |
| Traffic Analyst                            |                        | 982                    | 650          |

<sup>a</sup> Approximate N's, rounded to multiples of 5.

<sup>b</sup> No MOS data; discharged for unfitness or misconduct within one year.

Measurement of Job Performance. Most ACB studies to date have used a composite of supervisor and peer ratings of job knowledge, job skill, and promotability as a general global criterion. By detailed study on a small number of bench-mark MOS, a more articulated set of criteria is to be developed, utilizing standardized knowledge-proficiency measures, performance tests, and ratings refined by various techniques based on the rater's knowledge of job standards, characteristics of the rater, and the rater's relationship to ratee.

Construction of Objective Measures of Personality and Motivation. Use of perceptual and associative techniques are examples of objective personality measures to be developed as contrasted to the self-description or questionnaire tests currently in use.

Analysis of Components of Expressed Occupational Interests. Work already begun on interest tests in the mechanical, medical, and chemical fields will continue. Interest in particular activities involved in a job, preference for the surrounding conditions of work, such as autonomy, size of group, routine, physical conditions and demands, and of background and knowledge will be studied in relation to expressed occupational preferences. Findings will be the basis for interest tests to parallel the information measures being developed.

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